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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,758	01/15/2004	Luc Van Autryve	AMAT/8764.P1/FEP/OXD/JW	6404
44257	7590	07/13/2006		
PATTERSON & SHERIDAN, LLP 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			EXAMINER LEE, HSIEN MING	
			ART UNIT 2823	PAPER NUMBER

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/758,758

Applicant(s)

AUTRYVE ET AL.

Examiner

Hsien-ming Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 19, 20, 23, 24, 28-31 and 34-36 is/are rejected.
- 7) ☒ Claim(s) 6-18, 21, 22, 25-27, 32 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE  
PRIMARY EXAMINER

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20060313, 20050623, 20050502, 20040629, 20040423
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 1 (line 3), 9 (line 5) and 28 (line 3) are objected to because of the following informalities: the term “one or more” renders indefinite since it is not clear as to what number range is considered “more.” Appropriate correction is required.
2. Claims 19 (line 5), 23 (line 3) and 34 (line 2) are objected to because of the following informalities: the term “about 0.84 or greater” renders indefinite since it is not clear as to what number range is considered “greater”. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 19, 20, 23, 24, 28-31 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (US 5,599,590, submitted by applicants) in view of Kroon et al. (US 6,747,282) and Sandhu et al. (US 2005/0056940, submitted by applicants).

In re claim 1, Hayashi et al. teach a method of processing a substrate, comprising:

- depositing a layer comprising amorphous carbon on the substrate (col. 2, lines 5, 6, and 15); and then
- exposing the substrate to electromagnetic radiation (i.e. CO<sub>2</sub> laser, col. 4, lines 48-50 and 63) under conditions sufficient to heat the layer to a temperature of 300~1,000 ° C (col. 4, lines 55-57).

Hayashi et al. do not teach that the wavelength of the electromagnetic radiation is between about 600 nm and about 1,000 nm.

Kroon et al., in an analogous art, teach exposing amorphous carbon to electromagnetic radiation having wavelength between 400 and 1,100 nm (col. 12, lines 61-63) for the foregoing wavelength range can be readily absorbed by the amorphous carbon.

Therefore, it would have been obvious to one of the ordinary skill in the art, at the time the invention was made, to modify the electromagnetic radiation of Hayashi et al. so that the wavelength of the electromagnetic radiation is within the range of 400 and 1,100 nm, as suggested by Kroon et al., since by this manner the radiation can be readily absorbed by the amorphous carbon.

In re claim 2, Hayashi et al. teach that exposing the substrate to electromagnetic radiation comprises laser annealing the substrate (col. 4, lines 48-57).

In re claim 3, Hayashi et al. teach that the laser annealing comprises focusing continuous wave electromagnetic radiation into a line extending across a surface of the substrate (col. 5, lines 9-10).

In re claim 4, Hayashi et al. teach that electromagnetic radiation is provided by a lamp (col. 4, lines 48-50).

In re claim 5, Hayashi et al. do not teach that the amorphous carbon is deposited by plasma enhanced vapor deposition (PECVD).

However, using PECVD for depositing the amorphous carbon has been widely used in the art, as evidenced by Sandhu et al. (paragraph [0017]).

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Therefore, it would have been obvious to one of the ordinary skill in the art, at the time the invention was made, to use PECVD, as taught by Sandhu et al., for forming the amorphous carbon of Hayashi et al., since PECVD is a good means for depositing amorphous carbon.

In re claims 19, 20, 23, Hayashi et al. teach a method of processing a substrate, comprising:

- depositing a layer comprising amorphous carbon on the substrate (col. 2, lines 5, 6, and 15); and then
- laser annealing the substrate (i.e. using CO<sub>2</sub> laser, col. 4, lines 48-50 and 63) under conditions sufficient to heat the layer to a temperature of 300~1,000 ° C (col. 4, lines 55-57).

Hayashi et al. is silent as to the emissivity of radiation being about 0.84 or greater and the layer being between about 200 Å and about 2.5 µm. However, the selection of the foregoing parameters is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. In re Jones, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and In re Boesch, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious). In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. See M.P.E.P. 2144.05, III

In re claim 24, Hayashi et al. teach that the laser annealing comprises focusing continuous wave electromagnetic radiation into a line extending across a surface of the substrate (col. 5, lines 9-10).

In re claim 28, although it is noted that claim 28 is a product-by-process claim, product-by-process claims are directed to the product no matter how actually made. *In re Taylor*, 149 USPQ 615, 617 (CCPA 1966). Consequently, it is the patentability of the final product, and **not** the patentability of the process, that must be determined in a product-by-process claim. *In re Thorpe*, 227 USPQ 964, 966 (CAFC 1985), *Ex parte Edwards* 231 USPQ 981, 983 (BdPatApp&Int 1986). In this case, the final product is a substrate having a radiation treated amorphous carbon. With respect the final product, the teachings of Hayashi et al. also read on claim 28, as stated in the foregoing rejection against claim 1.

In re claim 29, Hayashi et al. teach that exposing the substrate to electromagnetic radiation comprises laser annealing the substrate (col. 4, lines 48-57).

In re claim 30, Hayashi et al. teach that the laser annealing comprises focusing continuous wave electromagnetic radiation into a line extending across a surface of the substrate (col. 5, lines 9-10).

In re claim 31, Hayashi et al. teach that electromagnetic radiation is provided by a lamp (col. 4, lines 48-50).

In re claim 34, Hayashi et al. is silent as to the emissivity of radiation being about 0.84 or greater and the layer being between about 200 Å and about 2.5 µm. However, the selection of the foregoing parameters are obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. *In re Jones*, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and *In re Boesch*, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious). In such a situation, the applicant must show

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that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. See M.P.E.P. 2144.05, III

***Double Patenting***

5. Claims 28-31, 35 and 36 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 1-4, 7 and 8. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Allowable Subject Matter***

6. Claims 6-8, 21, 22, 25-27, 32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 9 would be allowable if rewritten or amended to overcome the objection as set forth in this Office action.

8. Claims 10-18 are objected to as being dependent upon an objected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Tuesday-Thursday (7:30 ~ 6:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hsien-ming Lee  
Primary Examiner  
Art Unit 2823

July 7, 2006

HSIEN-MING LEE  
PRIMARY EXAMINER

7/7/06